PLENARY SESSION

The Necessity of Higher Engineering Education Transformation in Bulgaria in the AI Era

Mincho Hadjiski

Abstract

Starting from the strong enhancement of the notion "engineering" in variety of domains of human activity and taking into account the new arising tendencies in the Higher Engineering Education (HEE) in the paper the background possibilities toward a sustainable improvement of the HEE in Bulgaria are under consideration. The main attention is focused on the cardinal targets of the further AI-based HEE transformation: personalization, multimodal education, cognitive factors concerning, hybridization of HEE, incorporating AI-achievements in HEE, integrating new AI-based teaching resources. The personalization of HEE is based on the central idea of "the end of average statistical student" which is directed toward taking into account a variety of individual factors as level of knowledge, cognitive capabilities and adopted goals. In addition, the personal styles of learning and relevant didactic strategies must be fulfilled in synthesis of optimal learning trajectories and personalized assessment methods. Multimodal education should comprise three equally important aspects knowledge and skills, cognitive abilities and personal development. High efficiency of HEE will be not reachable without taking into account the newest psychological achievements according the impact of emotions and affects on the learning process. The hybridization of HEE contains a variety of dimensions – personalized ratio among class and on-line education; different possible Human-machine interaction, a variety of relation between available AI-based learning resources. In the paper a learning centered analysis is accomplished concerning new methods, procedures and tools based on AI, which are powerful source for further development of the theory and practice of HEE – mathematical modeling of the learners, learning data-mining and learning analytics, suitable directions of the machine learning in HEE-reinforcement learning, Q-learning, natural language processing (NLP) addressed to learning process, face/speech recognition, Intelligent Teaching Systems (ITS), Learning Management Systems (LMS).

The principal problems in creation of advanced HEE in Bulgaria are discussed in the paper-congratulations between industry and the system of HEE, misunderstanding of cardinality of digital, pedagogical and convective transformation, the necessity of large financial resources and time for realization, heterogeneity of different engineering profiles. A consideration of consistency available way for the HEE sustainable improvement in Bulgaria are discussed – the role of government policy, the participation of the centers of excellence and competence, the cooperation between respective engineering departments, the expedient participation of the National Scientific Foundation, the international collaboration.

An optimistic point of view is expressed at the end of the paper regarding the reachability of the discussed topics in transformation of the HEE.

Integration of Image Recognition in Information Systems

Georgi Kadrev

Abstract

A constantly growing share of the content that is produced nowadays is visual.

It is so much easier to produce visual content than to annotate it and organise it properly.

This is where image recognition comes into play. The integration of automated extraction of metadata from images and video frames via image recognition makes possible a lot of processes that would otherwise be omitted and at lot of value lost, leaving the visual content in a virtually unfindable and inaccessible state.

In this plenary session we demonstrate several practical use-case of image recognition and the benefits that the information systems and their users get from such integration.